TECHNICAL FIELD

[The technical field to which invention belongs] this invention relates to the network represented by GPS (Global Positioning System) and the Internet and NABISUTESHON which can offer various services by uniting data broadcasting further and giving a sex to information instancy.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] Conventionally, service which pinpoints the position on a map by GPS, and service of traffic congestion information were offered.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the conventional GPS, map information was individually offered by accumulation media, and the renewal of a map had to carry out rewriting of media, or exchange. Moreover, with the conventional service, the information included in accumulation media was pulled out, or only service of the traffic congestion information by communication was offered.
[0004] The technical problem of this invention is offering the network represented by GPS and the Internet and NABISUTESHON which can offer various services by uniting data broadcasting and giving a sex further to information instancy.

[Translation done.]

MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, NABISUTESHON of this invention is characterized by having a digital broadcast receiving means, a two-way communication means, a position detection means, a map information storage means, and a data-processing means.
[0006]
[Embodiments of the Invention] Hereafter, this invention is concretely explained with reference to a drawing. Drawing 1 is the conceptual diagram showing NABISUTESHON which is the gestalt of desirable operation of this invention.
[0007] In drawing 1 a sign 101 a GPS satellite, a sign 103, and a sign 110 for BS satellite and a sign 102 The Internet, An on-demand server and a sign 106 a sign 104 and a sign 105 A host server, A local server and a sign 111 a sign 107 or a sign 109 Information servers, such as GS (gas station), a sign 112 -- information servers, such as Store (restaurant), and a sign 113 -- in addition to this -- an information server and a sign 114 -- a beacon and a sign 115 -- text information transmitted by FM radio stations and a sign 116 -- a NABISUTESHON main part -- and A sign 117 expresses PDA (Personal Digital Assistant).

[0008] The on-demand server 104 receives the image information sent from the BS satellite 101, and provides the Internet 103 with service of image information. Moreover, the on-demand server 105 receives the position detecting signal sent from the GPS satellite 102, and provides the Internet 103 with service of position detection information. The Internet 103 connected to the on-demand servers 104 and 105 is further connected to the first end-connection child of the host server 106.

[0009] It connects with the local server 107 or 109, and the second end-connection child of the host server 106 supplies the information sent through the Internet 103 to the local server 107 or 109. The local server 108 is connected to still more nearly another Internet 110 besides the end-connection child to the host server 106. The information server 111 or 113 is connected to the Internet 110, for example, from the information server 111, the information about a gas station is supplied to the Internet 110, and restaurant information is supplied to the Internet 110 from the information server 112.
[0010] The local server 107 or 109 has the radio antenna for information communication, and the radio transmission of the information is carried out to NABISUTESHON 116 for [by which cable connection is not made through this antenna] mount. Although a wireless telephone circuit etc. is used, the radio transmission of this information may be based on a beacon 114, and may be based on text information transmitted by FM radio stations 115. In this case, as information transmitted, as for map information, the traffic congestion information on traffic, the confusion information on a circumference institution, etc. are mentioned from the first.
[0011] NABISUTESHON 116 has a sensor interface other than the radio antenna for information communication for receiving these information, and a sensor input is used as a trigger for measuring time progress. Furthermore, NABISUTESHON 116 has an interface for connecting with PDA117 containing all Personal Digital Assistants, and can perform accounting, such as a high-speed charge, by making personal information and a network link.
[0012] In order that NABISUTESHON 116 may have the accumulation section and may mitigate a communication load, it buffers and it has the function which updates the information which accumulates the map used well and accompanying information, and which was accumulated at the buffer according to operating frequency. Moreover, in this accumulation section, required user information can also be accumulated in advance by downloading the needed map set up beforehand.
[0013] Next, the host server 106 shown in drawing 1 , the on-demand server 104 or 105, the local server 107 or 109 and the information server 111, or the interrelation of 113 is explained in detail with reference to drawing 2 . In drawing 2 , in a sign 200, an on-demand server and a sign 220 show a local server, and, as for a host server and a sign 210, a sign 230 shows an information server.
[0014] The host server 200 consists of the on-demand index 201, the request means 202, a whole map database 203, management software 204, and a highway database 205. The on-demand server 210 consists of a transmission means 211 and an on-demand database 212. The local server 220 consists of the renewal robot 221 of a local map, a local map database 222, a receiving means 223, and a transmitting means 224. The information server 230 consists of a reference means 231, a transmission means 232, and an accompanying information database 233.
[0015] Through the receiving means 223 and the transmitting means 224, transmission and reception of the information by radio are possible for the local server 220, and radio connection can be made with NABISUTESHON. This local server is arranged in the predetermined geographical position, and can always be connected to one of the local servers 220 from NABISUTESHON.
[0016] The local map database 222 in the local server 220 is periodically updated by the renewal robot 221 of a local map. The renewal robot 221 of a local map communicates with the host server 200 periodically, and this updating is performed by judging whether a local map database needs to be updated.
[0017] If the updating check request of a map comes from the local server 220, the host server 200 will investigate whether update information is shown in the map of the local server 220 jurisdiction, and will update the local map database 222 of the local server 220 off-line, if updating is required.
[0018] Moreover, if there are various on-demand demands from a user through the local server 220, the on-demand index registered beforehand and this demand are collated, and if it is in the state where service can be offered, on-demand demand

information will be transmitted to the on-demand server 210 through the request means 202.

[0019] The on-demand server 210 will transmit the information accumulated at the on-demand database 212 to the local server 220 via the host server 200 by the transmission means 211, if the demand concerned is received from the host server 200. The local server 220 transmits this information to NABISUTESHON through the transmitting means 224.

[0020] The local server 220 transmits the demand concerned to the information server 230 soon from the receiving means 223, when a reference demand is received from NABISUTESHON. The information server 230 searches the accompanying information database 233 based on a reference demand, and transmits a reference result to a local server through the transmission means 232. The local server 220 transmits the reference result from the information server 230 to mobile communication devices, such as NABISUTESHON, soon from a transmitting means.

[0021] Next, the composition of NABISUTESHON is explained with reference to drawing 3 . In drawing 3 a data-broadcasting receive section and a sign 302 a sign 301 A teletext receive section, A sign 303 a traffic congestion information receive section and a sign 305 for a server information receive section and a sign 304 A map information receive section, A sign 306 a sensor receive section and a sign 308 for a positional information receive section and a sign 307 A user interface, A sign 309 CPU and a sign 311 for a PDA interface and a sign 310 A map drawing controller, A text output controller and a sign 313 a sign 312 The speech synthesis section, a sign 314 -- the speech recognition section and a sign 315 -- VRAM and a sign 316 -- a display and a sign 317 -- in memory and a sign 320, the user information transmitting section and a sign 321 express the accumulation section, and a sign 322 expresses [a loudspeaker and a sign 318 / a microphone and a sign 319] the positional information transmitting section

[0022] the data-broadcasting receive section 301, the teletext receive section 302, the server information receive section 303, the traffic congestion information receive section 304, the map information receive section 305, the positional information receive section 306, the sensor receive section 307, a user interface 308, and the PDA interface 309 -- and The information from the speech recognition section 314 is inputted into CPU310, and is stored in memory 319, and CPU310 reads and processes these information accumulated if needed from memory 319. It outputs to the map drawing controller 311, the text output controller 312, and the speech synthesis section 313. The information inputted into the map drawing controller 311 and the text output controller 312 is stored in VRAM315, and is outputted to a display 316 as a picture signal. Moreover, the information outputted to the speech synthesis section 313 is outputted to a loudspeaker 317 as a sound signal.

[0023] Memory 319 can use the accumulation section 321 as a buffer for connecting with the mass accumulation section 321, sending temporary information to the accumulation section 321, or mitigating a communication load if needed. Further, it connects with the user information transmitting section 320 and the positional information transmitting section 322, and by transmitting user information or transmitting the present positional information to a server side, memory 319 is constituted so that it can realize on demand one by the user.

[0024] Next, the gestalt of concrete service of NABISUTESHON concerning this invention is explained, referring to drawing 4 or drawing 6 .

[0025] Drawing 4 shows the flow of processing of the Navigation Services which offers synthetic information, such as confusion information not only on map information but the circumference institution using NABISUTESHON concerning this invention.

[0026] In drawing 4 , Step (henceforth "SP") 400 expresses the start of processing of this service. In SP401, in order to obtain the map near the current position of NABISUTESHON, the local server corresponding to the current position is specified. In SP402, it judges whether it is necessary to update the map information on NABISUTESHON. Since NABISUTESHON has the accumulation section 321 as drawing 3 explained, the map information data used well are accumulated beforehand at the accumulation section concerned. Therefore, when required map information has already existed in NABISUTESHON, it is not necessary to update map information, and it progresses to SP405. On the other hand, when required map information does not exist in NABISUTESHON, new map information is downloaded from a local server by SP403, the accumulation data of the accumulation section of NABISUTESHON are updated by SP404, and it progresses to SP405.

[0027] In SP405, it judges whether there was any demand from a user. As this demand, the acquisition demand of information other than a map, for example, the gas station near the current position from the vehicles under run and the positional information of a restaurant, and the demand which accompanies it are included. If it is the case of a gas station and is the case of a gasoline price, the content of service, and a restaurant, a confusion situation, the content of a menu, etc. will be mentioned to an accompanying demand. As drawing 1 explained, the information server is installed in institutions, such as a gas station and a restaurant, and the information corresponding to the kind of each institution is offered according to the demand from a user (SP406).

[0028] In SP407, the information transmitted from the local server of map information and others is displayed on NABISUTESHON. Since the current position may be changed when continuing Nabih further from the vehicles under run, the processing which returned SP401 processing and mentioned it above by SP408 is repeated. When not continuing Nabih, it progresses to SP409, and Nabih is ended.

[0029] Drawing 5 shows the flow of processing of the time discount service of a high-speed charge using NABISUTESHON concerning this invention.

[0030] SP500 expresses the start of processing. On the present highway, even if a charge is determined by distance, it takes time by traffic congestion and it does not start, a charge does not change, but when time is taken by traffic congestion, it loses the merit of highway original. Therefore, in order to measure the run duration of a highway, in SP501, first, in case a highway is entered, the count of time is started, and the time is recorded on PDA, such as an IC card. And the count of time is ended by SP506 at the time of gate out, and while calculating the duration of a highway run by NABISUTESHON from the entering-the-starting-gate time recorded on PDA by SP507, and gate out time, the run section or mileage is calculated by NABISUTESHON.

[0031] However, by the flow of above-mentioned processing, in order to also count the time which rested by the parking area in the middle of a highway, the sensor which can sense passage of run vehicles is formed in the entrance of a parking area. When the vehicles which carried NABISUTESHON go into a parking area, sensing information is sent to NABISUTESHON from the sensor concerned, it is judged that there was a sensor input by SP503, and the count of the stoppage time in a

parking area is started by SP504. And when vehicles come out of a parking area, sensing information is sent to NABISUTESHON carried in vehicles from the sensor of the outlet of a parking area, and the count of stoppage time is ended by SP505. In this case, stoppage time is deducted in case a duration is calculated by SP507 who mentioned above.

[0032] The information calculated by NABISUTESHON by SP507 is transmitted to a host server by SP508, and settlement of accounts of a charge is performed on a host server. Under the present circumstances, when carrying out accounting using cybermoney etc., it is connection with PDA and NABISUTESHON which can specify an individual, and Individual ID can transmit to a host server and can charge.

[0033] Drawing 6 shows the flow of processing of the on-demand service which meets the demand of a user using NABISUTESHON concerning this invention.

[0034] SP600 expresses the start of processing. In SP601, it judges whether there was any on-demand service request from a user. When there is no demand, waiting for a demand is performed again, when there is a demand, the demand from a user is transmitted to a host server through a local server by SP602, and service is collated between host servers. That is, in order that each demand server may offer on-demand service, in a host server, the index which can be served is managed and collating with the on-demand service request from a user and the index which the host server has managed is performed. As service, it is Music which can listen to the music of a wish, for example. On Information which offers information other than management of Demand or a local server On Demand etc. is mentioned.

[0035] By SP603, when the demand from a user is judged to be the service which a host server is offering as a result of collating, it lets a host server pass from a demand server, information is transmitted to a local server, and information is transmitted to NABISUTESHON from a local server. When the demand from a user is judged not to be the service which a host server is offering, it returns to SP601 and demand waiting from a user is performed again.

[Translation done.]

* NOTICES *

EFFECT OF THE INVENTION

[Effect of the Invention] According to NABISUTESHON of this invention, the network represented by GPS and the Internet and various services which were made to unite data broadcasting further and gave the sex to information instancy can be offered so that clearly from the above explanation.

[Translation done.]

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TECHNICAL FIELD

[Industrial Application] About a multiplex-broadcasting receiving set, especially, this invention is used combining information processors, such as for example, car navigation equipment, and relates to the multiplex-broadcasting receiving set for supplying receiving contents to these information processors.

[Translation done.]

* NOTICES *

TECHNICAL PROBLEM

[Description of the Prior Art] The FM multiplex broadcast receiving set formed in vehicles in relation to the car navigation equipment carried beforehand is indicated by JP,6-224796,A. In addition, the dead-reckoning navigation which guesses that the relative position of a self-vehicle is car navigation equipment based on for example, a direction sensor or a distance robot, and the electric wave emitted from a satellite are received. It is equipment which considers the traffic information about traffic congestion etc., and the current position is expressed as real time on a map screen, or displays [which displays and automatic-searches] the root to the destination using the satellite navigation (Global Positioning System) of a self-vehicle which measures a position absolutely. Moreover, an FM multiplex broadcast puts the subbroadcast which consists of digital information of the main broadcast which is FM stereophonic broadcast, and the traffic information and weather intelligence for every area which consists of analog speech information, such as music and news, on one electric wave, and transmits.

[0003] Although the multiplex-broadcasting receiving set of an indication in this official report receives the FM multiplex broadcast from two or more broadcasting stations, if a predetermined area is specified by the user, it is constituted so that the local information which receives the FM multiplex broadcast from the broadcasting station which responds and starts this designated area, and is included in the received contents of multiplex broadcasting may be given to the navigation system of the next step.

[0004] What chooses the information on relevance as a designated area as informational selection which received as conventionally mentioned above is known. However, when an FM multiplex broadcast receiving set was used combining a navigation system, it was desirable that it is also equipment which chooses the information on relevance from the information transmitted by the FM multiplex broadcast as the kind which a navigation system requires, and is supplied to a system, and there was such no multiplex-broadcasting receiving set conventionally.

[0005] So, the purpose of this invention is offering the multiplex-broadcasting receiving set which extracts from the contents of multiplex broadcasting which have the information on the kind which it requires received to the combined information processor, and is sent out to it.

[Translation done.]

MEANS

[Means for Solving the Problem] A multiplex-broadcasting receiving set according to claim 1 is used combining an information processor, is equipment which receives multiplex broadcasting which consists of subbroadcast including the main broadcast and at least one or more kinds of information, receives multiplex broadcasting, and it has the control means which choose the information on relevance as the kind which an information processor requires as an information reception extraction means extract the above-mentioned information from reception broadcast, among the extracted information, and send out to an information processor, and it is constituted.

[0007] The control means of a receiving set according to claim 1 are further equipped with a kind judging means, a sending-out judging means, and a sending-out means, and a multiplex-broadcasting receiving set according to claim 2 is constituted.

[0008] A kind judging means judges whether the information extracted by the information reception extraction means is the information on relevance in the kind which an information processor requires, and it judges [whether a sending-out judging means should send out the extraction information judged by the demand kind to be relevance to an information processor, and], and a sending-out means is constituted according to having been judged with the power send out by the sending-out judging means so that extraction information may be sent out to an information processor.

[0009] A multiplex-broadcasting receiving set according to claim 3 is constituted so that the sending-out judging means of a receiving set according to claim 2 may include an updating judging means further.

[0010] It is constituted so that the information which a multiplex-broadcasting receiving set according to claim 3 receives may be judged to be the power to which the update flag of the extraction information judged by the demand kind by the kind judging means of the above-mentioned [an updating judging means] to be relevance sends out this extraction information to an information processor according to it being shown that the contents of this information were updated including the update flag which shows whether the contents were updated from the contents broadcast last time.

[0011] In a multiplex-broadcasting receiving set according to claim 2 or 3, as for a multiplex-broadcasting receiving set according to claim 4, the sending-out means includes an edit sending-out means further.

[0012] An edit sending-out means is constituted so that two or more extraction information judged to be the power sent out by the above-mentioned sending-out judging means may be edited into the unit which can be processed with an information processor and may be sent out to an information processor.

[0013] In a multiplex-broadcasting receiving set according to claim 1 to 4, a multiplex-broadcasting receiving set according to claim 5 is constituted so that it may be equipment for the navigation by which an information processor is carried in vehicles.

[Translation done.]

* NOTICES *

OPERATION

[Function] In a multiplex-broadcasting receiving set according to claim 1, only the information on relevance in the kind which an information processor requires among the information in received multiplex broadcasting by the information reception extraction means and control means is alternatively sent out to an information processor.

[0015] In a multiplex-broadcasting receiving set according to claim 2, if the information extracted out of reception broadcast by the information reception extraction means is judged to be the power which it is judged with the kind corresponding to the demand kind of information processor by the kind judging means, and is sent out to an information processor by the sending-out judging means, it will respond and will be sent out to an information processor by the sending-out means.

[0016] In a multiplex-broadcasting receiving set according to claim 3, the extraction information on relevance in a demand kind is judged to be what should be sent out to an information processor, when it judges that it is shown by the update flag that the contents of this information were updated by the updating judging means of a sending-out judging means.

[0017] In a multiplex-broadcasting receiving set according to claim 4, after two or more information which should be sent out to an information processor among the information extracted from reception broadcast is edited into the unit which can be processed with an information processor by the edit sending-out means, it is sent out to an information processor.

[0018] Since an information processor is navigation equipment in a multiplex-broadcasting receiving set according to claim 5 Only the information on relevance in the kind which navigation equipment requires by the kind judging means is extracted from receipt information, and in other words, the extracted information is sent out to navigation equipment by the sending-out means only within the time of being judged with the contents of extraction information being a broadcast part last time, and being updated by the updating judging means, when judged with what should be sent out to navigation equipment by the sending-out judging means. Furthermore, at the time of this sending out, two or more information which should be sent out by the edit sending-out means is sent out, after being edited into the unit which can be processed with navigation equipment.

[Translation done.]

EXAMPLE

[Example] Hereafter, with reference to a drawing, one example of this invention is explained in detail.

[0020] Drawing 1 is the block block diagram of the FM multiplex broadcast receiving set in the state where it was used combining the navigation equipment by one example of this invention. Drawing 2 is drawing showing partially the content of the memory in the FM multiplex broadcast receiving set shown in drawing 1 . Drawing 3 is drawing showing FM multiple signal by one example of this invention by which frequency conversion was carried out. Drawing 4 is drawing showing the composition of the principal part of the data packet by one example of this invention. Drawing 5 is a flow chart which shows the data sending-out procedure to the navigation equipment of the FM multiplex broadcast receiving set by one example of this invention.

[0021] In drawing 1 , the FM multiplex broadcast receiving set 1 is used combining navigation equipment. An antenna 10 and an antenna 10 are minded. As opposed to the demodulator circuit 13 which recovers the filter 12 which extracts a multiple-signal component, and the extracted multiple-signal component from the FM receiving circuit 11 which receives an FM multiplex broadcast, and the received FM multiplex broadcast to the original data, and the data to which it restored Error correction The communication interface 17 for making communication connection of the memory 16 and the navigation equipment 2 for memorizing the data relevant to processing of the microcomputer (the abbreviation for a microcomputer) 15 for carrying out centralized control of the error correction circuit 14 and equipment 1 the very thing to perform and a microcomputer 15 is included.

[0022] Navigation equipment 2 contains the I/O section 23 for performing data I/O between the processing sections 22 and the exteriors (crew) which perform position detection processing of vehicles in which navigation equipment 2 was carried in parallel to transceiver processing of data with the receiving set 1 through the communication interface 21 for making communication connection of the FM multiplex broadcast receiving set 1 and the interface 21, map display processing, path planning processing, etc.

[0023] In addition, it is assumed that communication interfaces 17 and 21 exchange data according to the communication procedure of a start-stop using the thing according to RS-232C.

[0024] In operation, the FM receiving circuit 11 changes the input from an antenna 10 into a signal as shown in baseband, i.e., drawing 3 . Since the signal by which frequency conversion was carried out is a composite signal of FM stereo signal, a pilot signal, and FM multiple signal as shown in drawing 3 , by passing the band-pass type filter 12 which makes 76kHz center frequency, FM sum (L+R) signal, FM difference (L-R) signal, and a pilot signal are removed, and a multiple signal can be taken out. Next, the data which corrected the error are given to a microcomputer 15 by carrying out the L-MSK (Level-Controlled-MSK) recovery of this multiple signal by the demodulator circuit 13, and carrying out error correction in the error correction circuit 14.

[0025] The data obtained as mentioned above are the data packet PA to which the information for communication operation of BIC (block identification code) as shown in drawing 4 , a CRC sign, a check bit (CB), etc. was added. A CRC sign and a check bit CB are the information for error detection (correction). By the FM multiplex broadcast method, BIC, data packets PA and CRC, and a check bit CB are made into one unit, and the method which summarizes 272 of these at a time, and is transmitted is adopted.

[0026] A data packet PA expresses the kind of information this data packet PA indicates Prefix PF to be, including Prefix PF and a data block DB further etc., and a data block DB expresses the information itself.

[0027] Furthermore, Prefix PF contains the service discernment SI, the decode discernment flag F1, the information ending flag F2, an update flag F3, the data group number GN, and the data packet number PN. The service discernment SI mainly specifies the classification of the content of a program, i.e., the classification of the content of the data block DB of correspondence, for example, alphabetic information, figure information, traffic information, additional information, etc.

[0028] The decode discernment flag F1 shows whether transmission of the data group transmitted by the data group number GN of correspondence ends the information ending flag F2 about error correction processing.

[0029] the case where increment an update flag F3 one and it is transmitted when the data group transmitted by a certain data group number is updated, and it is not updated -- last time -- sending out -- it is transmitted with the same flag as an update flag F3 the bottom That is, it is shown whether the contents, such as traffic information which the content of a data packet PA mentioned above expresses, are already broadcast once, or the content is changed last time more newly than broadcast.

[0030] The data group number GN shows the number for every data group assigned in case a data group is transmitted, and the data packet number PN shows the number of the data packet transmitted for every data group number. Thus, the data group number GN and the data packet number PN are information which distinguishes the information on this data packet PA still more finely. For example, suppose that the data group number GN received the data packet which the information which the block DB of the data packet PA whose data packet number PN is B shows shows "the traffic congestion information on Crossing C" by A, and shows "Crossing C is under traffic congestion about it being" at a certain time. Then, when the data packet PA with the same data group number GN and the data packet number PN is received, it can judge whether the traffic information was updated or the traffic information is last time the same as a broadcast part with checking the update flag F3.

[0031] The input packet PA is a packet of relevance in the kind of information demanded from navigation equipment 2,

returning to drawing 1 , and a microcomputer 15 inputting the data packet PA of drawing 4 received and obtained, and referring to the content of memory 16, and when it is judged that the content of information was updated from the broadcast content last time, this input packet PA is sent out to navigation equipment 2 through a communication interface 17.

[0032] Here, the composition of memory 16 is explained. As shown in drawing 2 , memory 16 contains memory storage M1 and M2. The classification RD of the data which show the kind of information (traffic information in this case) as which navigation equipment 2 requires an input to a field M2 is given to the microcomputer 15 of a receiving set 1, a microcomputer 15 receives this, and it stores in a field M2. The sending-out data Di (i= 1, 3 [2 and 3], --) are stored in a field M1 one by one to each data packet PA sent out to navigation equipment 2. The update flag F3 of the data packet PA of correspondence, the data group number GN, and the data packet number PN make it an update flag 161, the data group number 162, and the data packet number 163, and are stored in the sending-out data Di, respectively.

[0033] About each data packet PA received and inputted, a microcomputer 15 searches the sending-out data Di of memory 16 based on the data group number GN and the data packet number PN. When the data Di containing a reference result, the data group number GN of the input packet PA and the data packet number PN, and the numbers 162 and 163 that are in agreement, respectively are obtained, the update flag F3 of this input packet PA is compared with the flag 161 of correspondence to the data Di. If a comparison result and both flags are the same, the information which this input packet PA shows is not updated from a broadcast content last time. that is, it is already judged with the thing of sending out to equipment 2, and this input packet PA throws away -- having (deleted), if both flags differ While updating last time the information which this input packet PA shows from the broadcast content, i.e., being judged with un-sending out by equipment 2 and sending out this input packet PA to navigation equipment 2 In order to show having been sent out, the flag 161 of the data Di in the memory 16 is updated with the flag F3 of the packet PA sent out this time.

[0034] If the data Di containing the above-mentioned reference result, the data group number GN of the input packet PA and the data packet number PN, and the numbers 162 and 163 that are in agreement, respectively are not obtained, while being judged with this input packet PA showing new information and being sent out to navigation equipment 2, additional storing of the new sending-out data Di with which the update flag F3, the data group number GN, and the data packet number PN were set to each of a flag 161 and numbers 162 and 163 is carried out at

[0035] Next, according to the flow chart of drawing 5 , the data sending-out procedure from the FM multiplex broadcast receiving set 1 to navigation equipment 2 is explained. In addition, the store of this flow chart is beforehand carried out to memory 16 as a program, and it is performed with a microcomputer 15.

[0036] First, since navigation equipment 2 gives the demand data classification RD which shows the purport whose information to demand is traffic information to a microcomputer 15, a microcomputer 15 receives the given demand data classification RD, and stores it in the field M2 of memory 16 (S1).

[0037] Next, a microcomputer 15 inputs the data packet PA which was processed by the circuit of the preceding paragraph and obtained, and it judges whether the information which the data block DB of this input packet PA shows is information on the kind which navigation equipment 2 requires according to whether the service discernment SI of the input packet PA is in agreement with the demand data classification RD of memory 16 (S2). Although this input packet PA is deleted since the information which this input packet PA shows is not traffic information, if the service discernment SI of the input packet PA is inharmonious in the demand data classification RD at this time (S3), if it is coincidence, it will judge [whether the content of the traffic information which this input packet PA shows is the packet PA which shows whether it is updated from a broadcast part last time, and new input, and] (S4).

[0038] In detail, based on the data group number GN of the input packet PA, and the data packet number PN, the sending-out data Di of memory 16 are searched, and if the sending-out data Di containing the numbers 162 and 163 which are in agreement with the numbers GN and PN of the reference result input packet PA, respectively are obtained, the update flag 161 of correspondence and the update flag F3 of the input packet PA will be further compared with these sending-out data Di. a comparison result, although it is judged with having no need for sending out and is deleted, since the information on this input packet PA is not updated from a broadcast part last time if in agreement (S5) It is judged with the power sent out since the information on this input packet PA is updated from a broadcast part last time if inharmonious. While this input packet PA is sent out to navigation equipment 2, the flag 161 of the sending-out data Di of correspondence is updated by the update flag F3 of this input packet PA (S6).

[0039] While it is judged with what has the traffic information that this input packet PA is new if the sending-out data Di containing the numbers 162 and 163 which are in agreement with the numbers GN and PN of the reference result and input packet PA on the other hand, respectively are not obtained, and being sent out to navigation equipment 2, the content makes it memory 16 at the sending-out data Di, and additional storing is carried out (S6).

[0040] By the way, since navigation equipment 2 is performing processings peculiar to navigation, such as position detection processing, map display processing, and path planning processing, in parallel to the reception of the data from the multiplex-broadcasting receiving set 1, receiving unnecessary data (information or the same information by which recurrence broadcast is carried out other than traffic information in this case) will make a processing load high, and it causes the fall of processing speed. Although the way prepare the buffer in which the data transmitted to the navigation equipment 2 side from a broadcasting station can fully be stored, memorize transmit data temporarily here, and other processing loads carry out batch processing of the data in this buffer at the time of a low is also considered in order to cancel this In the cost rise of the equipment 2 accompanying a buffer addition, or informational batched processing, supply [real time / information / which is the feature of equipment 2] / is spoiled, problems, like a man machine interface is inferior are not avoided, and it cannot become a fundamental dissolution measure.

[0041] Then, in this example, since a receiving set 1 adjusts the sending-out data to equipment 2 based on the demand data classification RD and an update flag F3 and is attaining optimization so that reception of unnecessary data may not be performed by navigation equipment 2 as mentioned above, such un-arranging is prevented effectively.

[0042] In addition, in order to reduce the processing load in equipment 2 further, after editing a data packet per the unit of the information which can be processed with equipment 2, for example, a data group unit, and program, you may make it send out to navigation equipment 2, although it was made to carry out data sending out to navigation equipment 2 for every data packet in the example. Moreover, although the information on the kind which equipment 2 requires was made into

traffic information, you may be the information on other kinds, for example, a weather report.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] According to the multiplex-broadcasting receiving set according to claim 1, it is effective in the ability to extract alternatively and give out of the broadcast which has only the information on the kind required of the information processor combined and used about the information processing received.

[0044] The multiplex-broadcasting receiving set which is applied to the claim 1 mentioned above according to the claim 2 is the thing of the kind which an information processor requires among the information extracted out of broadcast using a kind judging means, a sending-out judging means, and a sending-out means. Since only the information judged to be what exists and sent out to an information processor is sent out to an information processor, it is lost that the information which is not needed for an information processor is given, and it is effective in the processing load in the part information processor being mitigated.

[0045] since it sees although the sending-out judging means of the multiplex-broadcasting receiving set which is applied to the claim 2 mentioned above according to the claim 3 is updated with broadcast it last time, and its contents among the receipt information of relevance in a demand kind are sent out to an information processor, including an updating judging means further, while it is lost that the information on the completely same contents overlaps and an information processor (repeating) is given and the processing load in an information processor is mitigated further It is effective in improvement in processing efficiency being achieved.

[0046] Since it sends out according to the claim 4 after the multiplex-broadcasting receiving set concerning the claims 2 or 3 mentioned above edits the information on these plurality into the unit which can be processed with an information processor further rather than does not send out separately the information which should be sent out to an information processor including an edit sending-out means, it is effective in the load about information radial transfer with a multiplex-broadcasting receiving set being sharply reduced in an information processor.

[0047] Since the information processor combined with the multiplex-broadcasting receiving set concerning the claim 1 mentioned above or either of 4 is navigation equipment carried in vehicles according to the claim 5, it is effective in the ability to be able to obtain the multiplex-broadcasting receiving set which can extract only the information on relevance in a demand kind alternatively, and can give it to it out of multiplex broadcasting received by navigation equipment.

[0048] Moreover, while the unnecessary information which does not correspond to the kind demand is not given to navigation equipment, the contents are not updated, namely, the information on the same contents is not given repeatedly, since it is given after collected into the unit which can process two or more information, a load is mitigated, and navigation equipment is further effective in the efficiency of the navigation processing which considered the part receipt information improving.

[Translation done.]

* NOTICES *

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TECHNICAL FIELD

[Industrial Application] In a **** cooperation type road transportation system, this invention relates to the traffic
information offer system which provides a driver etc. with the detailed road map information which a road infrastructure
holds through a move terminal, when move terminals, such as mounted equipment and a personal digital assistant, do not
have a map database.

[Translation done.]

* NOTICES *

PRIOR ART

[Description of the Prior Art] Drawing 20 is the block diagram showing the conventional traffic information offer system indicated by the KEC information for example, on the Kansai electronic industry promotion center issue (No. January, 1994 [148 or], p.14-p.20). The information gathering section in which 1 collects traffic informations, such as traffic information, such as traffic congestion and accident, and regulation, construction, in drawing, The information processing and the editorial department which performs processing and edit of 2 matching various information with a unific link (intercept of the numbered passage network), and processes the information with which mounted equipment can be provided, 3 consists of three information offer media, a beacon, an FM multiplex broadcast, and a tele terminal. The information offer section which provides mounted equipment with the information processed in information processing and the editorial department 2, and 4 are the information practical use sections which are carried in mounted equipment, display the information from the information offer section 3 on a display, or transmit it to a driver with voice.
[0003] Next, operation is explained. In the information gathering section 1, the traffic control system in the Public Safety Commission and a road administrator etc. collects road traffic information, such as traffic congestion and accident. The center (VICS Center) of the vehicle information communication system which are information processing and an editorial department 2 is provided with those information through Japan Road Traffic Information Center. Moreover, in the information gathering section 1, the full/vacant informations of a parking lot etc. are collected, and they let Japan Road Traffic Information Center pass, or it is directly provided for VICS Center. In VICS Center, the processing and edit of attaching various information to each link which were offered are performed, and it is processed into the information which can be used with mounted equipment. The processed information is sent to the information offer section 3. The information offer section 3 transmits information taking advantage of the property of each information offer media.
[0004] That is, beacons are high-speed intermittent minimum zone type information offer media, and transmit the information on a different content for every beacon to mounted equipment. FM multiplex broadcasts are the information offer media of a broader-based zone type medium speed, bundle up a lot of common information, and transmit it to mounted equipment. Tele terminals are the information offer media of a requested type low speed, and transmit optional information. The information practical use section 4 receives the information from each information offer media, displays the received information on a display unit, or provides a driver with it with voice.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Since the conventional traffic information system is constituted as mentioned above, the information sent to each information offer media from information processing and the editorial departments 2, such as VICS Center, remains as it is, and is the information which can be used with mounted equipment. Therefore, if it is going to provide mounted equipment with a lot of information which can be used with mounted equipment as they are, the amount of transmissions of the information between information processing and an editorial department 2, and each information offer media becomes huge, and when channel capacity in the meantime is not large, the real time nature of provided information will be lost. Therefore, the simple map information which can display only the information about a highway as shown in drawing 21 in fact as opposed to each information offer media is transmitted. And each information offer media offer simple map information to mounted equipment. When mounted equipment holds the map database by CD-ROM etc., the information practical use section 4 superimposes the applicable detailed map in a map database, and the information supplied from each information offer media, and can display detailed information. However, when mounted equipment did not hold the map database and there was no last destination on the highway in the offered simple map information, there was a trouble that a driver could not grasp correctly passage related information, such as traffic congestion and regulation information, or the path guidance information in the path which reaches the last destination. Moreover, if updating management of the content is not performed when mounted equipment holds the map database, mismatching will arise among the various information supplied from the information offer section 3. However, a user (driver) is burdened with time and effort and costs at updating management of the map database in mounted equipment. That is, even when mounted equipment held the map database, there was a trouble of burdening a user with time and effort and costs for utilizing the various information which a passage infrastructure (henceforth passage infrastructure) side supplies with mounted equipment.
[0006] This invention can provide mounted equipment etc. with the newest detailed road map information from a passage infrastructure side, without having been made in order to cancel the above troubles, and increasing the amount of transmissions of the information between information processing and an editorial department, and each information offer media. consequently, even when mounted equipment etc. does not hold the map database Moreover, it aims at obtaining the traffic information offer system which can always offer the newest passage related information and the newest path guidance information according to a demand of a user, without applying the burden of time and effort or costs to a user, when mounted equipment etc. holds the map database.

[Translation done.]

MEANS

[Means for Solving the Problem] An information centre has a supply means supply a changed part of a traffic information to road-side equipment, and the traffic information offer system concerning invention according to claim 1 has an information restoration means by which road-side equipment restores the traffic information after change from the traffic information before change remembered to be a changed part of the traffic information supplied from the information centre, and a traffic information supply means supply the restored traffic information to the terminal unit carried by the mobile.

[0008] The traffic information offer system concerning invention according to claim 2 Set to a traffic information offer system according to claim 1, and an information centre has an optimal-path search means to search for the optimal path from each road-side equipment to the every place point within a jurisdiction as path guidance information. An optimal path with the road-side equipment from the self-equipment using the path guidance information supplied from the information centre to [optimal path] the every place point in a jurisdiction field, the road map information included in a traffic information, and/or road related information are superimposed. It has a compound path guidance information creation means with road related information to supply the superimposed information to a terminal unit according to the demand from a terminal unit in which it was carried by the mobile.

[0009] In a traffic information offer system according to claim 2, the traffic information offer system concerning invention according to claim 3 has the means of communications to which an information centre carries out multiple address transmission of at least one of the road map information within a jurisdiction, passage related information, and path guidance information, and has an information logging means by which road-side equipment starts the information in a jurisdiction field from the information by which multiple address transmission was carried out.

[0010] An information centre has the means of communications which carries out multiple address transmission of the road map information among traffic informations, and the traffic information offer system concerning invention according to claim 4 has the information logging means which starts the information which the terminal unit carried in the mobile uses with self-equipment from the road map information by which multiple address transmission was carried out from the information centre.

[0011] The traffic information offer system concerning invention according to claim 5 An optimal-path search means by which set to a traffic information offer system according to claim 1, and an information centre searches for the optimal path from each road-side equipment to the every place point within a jurisdiction as path guidance information, It has the means of communications which carries out multiple address transmission of at least one of the road map information within a jurisdiction, road related information, and path guidance information. A data setting means by which the terminal unit with which road-side equipment has the information logging means which starts the information in a jurisdiction field from the information by which multiple address transmission was carried out from the information centre, and was carried in the mobile sets the classification of the traffic information which requires supply as road-side equipment, It has the information logging means which starts the information used with self-equipment from the information by which multiple address transmission was carried out from the information centre.

[0012] The traffic information offer system concerning invention according to claim 6 has the information-requirements control means to which the terminal unit carried in the mobile carries out the selection output of the demand which asks for supply of road map information and passage related information according to the relation of the map range of road map information and the position of a mobile which are held automatically in a traffic information offer system according to claim 5.

[0013] The traffic information offer system concerning invention according to claim 7 has the information-requirements control means to which the terminal unit carried in the mobile carries out the selection output of the demand which asks for supply of road map information and passage related information according to the updating situation of passage related information automatically in a traffic information offer system according to claim 5.

[0014] The traffic information offer system concerning invention according to claim 8 has the information-requirements control means to which the terminal unit carried in the mobile carries out the selection output of the demand which asks for supply of road map information and passage related information according to the relation of the range of road map information and the position of a mobile which are held, and the updating situation of passage related information automatically in a traffic information offer system according to claim 5.

[0015] The traffic information offer system concerning invention according to claim 9 In a traffic information offer system given in any 1 term of claims 1-3 and the claims 5-8 A terminal road map storage means by which the terminal unit carried in the mobile stores two or more road map information, It has the terminal road map management tool which searches the road map information to which the position of a mobile hits a center section from a terminal road map storage means, and an information-requirements generating means to generate a supply demand of road map information when the road map information to which it corresponds does not exist in a terminal road map storage means.

[Translation done.]

* NOTICES *

OPERATION

[Function] The information centre in invention according to claim 1 supplies only a changed part of traffic informations, such as road map information and road related information, to road-side equipment. Road-side equipment memorizes the information which received the traffic information last time, and restores a new traffic information from a changed part and the contents of storage of a traffic information which were received. And the restored traffic information is supplied to the terminal unit carried by the mobile.

[0017] The road-side equipment in invention according to claim 2 superimposes the path guidance information which is one of the traffic informations supplied from the information centre on road map information and/or road related information, and changes it into the indicative data which the terminal unit carried in the mobile can display.

[0018] From an information centre, the road-side equipment in invention according to claim 3 starts the portion within a jurisdiction of self-equipment among the traffic informations by which multiple address transmission has been carried out, and is received.

[0019] The information centre in invention according to claim 4 makes road map information common information, and carries out multiple address transmission. Road-side equipment is cut down so that logging reception of the road map information which needs the terminal unit carried in the mobile can be performed, and it supplies information to a terminal unit.

[0020] The terminal unit carried in the mobile in invention according to claim 5 requires a required traffic information individually from road-side equipment. Road-side equipment is supplied to the terminal unit in which path guidance information, road map information, and road related information were separately carried by the mobile, respectively according to a demand.

[0021] The terminal unit carried in the mobile in invention according to claim 6 requires road related information, when the current position of a mobile is contained in predetermined within the limits of the map range of the road map information which self-equipment holds, and when that is not right, it requires new road map information.

[0022] The terminal unit carried in the mobile in invention according to claim 7 requires road related information, when road related information is not updated over the predetermined period.

[0023] The terminal unit carried in the mobile in invention according to claim 8 chooses automatically the supply demand of road map information and road related information based on the both sides of the relation between the current position of a mobile, and the road map information currently held, and the updating situation of road related information.

[0024] The terminal unit carried in the mobile in invention according to claim 9 requires new road map information, only when the road map information which self-equipment does not hold is needed.

[Translation done.]

EXAMPLE

[Example]
The example of this invention is explained about drawing below example 1. Drawing 1 is the block diagram showing the composition of the traffic information offer equipment by the 1st example of this invention. In the passage infrastructure 26 in drawing 1 , 16 is road-side equipment which passage related information including information, such as road traffic information, such as traffic congestion and accident, construction, regulation, and a road surface situation, is collected, and the information centre which makes passage related information the information which can be used with mounted equipment, and transmits, and 25 are prepared in the road side within a jurisdiction of an information centre 16, and transmits the information from an information centre 16 to passage vehicles etc. In addition, much road-side equipments 25 are formed in the area within a jurisdiction of an information centre 16. Moreover, 30 is a move terminal (terminal unit carried in the mobile) which receives information offer from the passage infrastructure 26 side.
[0026] An information gathering means by which 10 collects passage related information in an information centre 16, A road map information management means to perform updating management of the road map information within a jurisdiction that 11 is stored in the road map information-storage means 12, A local passage related information processing means to attach the various information in passage related information to a unific link in order that 13 may make passage related information the information which can be used by the mounted equipment side, An information-compression means to perform the information compression and information curtailment of the road map information to which 14 is outputted from the local passage related information processing means 13, or passage related information, 15 is the means of communications for receiving a demand etc. from each road-side equipment 25 while performing information transmission in each road-side equipment 25 grade with a wire communication, data broadcasting, satellite communication, or a mobile phone method.
[0027] The means of communications for transmitting a demand etc. to an information centre 16 in each road-side equipment 25, while 17 receives information from an information centre 16 with a wire communication, data broadcasting, or satellite communication, The means of communications for 18 communicating with the move terminal 30 by radio (electric wave or light) communication, An information restoration means to restore the information to which the information compression of 19 was carried out from the information centre 16, A local road map information management means to perform updating management of the road map information which 20 received through the information restoration means 19, A local road map information-storage means to store the road map information for which updating management of 21 is carried out by the local road map information management means 20, 22 superimposes the road map information within the local road map information-storage means 21, and the passage related information which received through the information restoration means 19, and creates compound map information. A compound map information creation means to output compound map information to means of communications 18 according to the demand from the move terminal 30, A compound map information-storage means to store the compound map information that the compound map information creation means 22 created 23, and 24 are move terminal measurement information processing meanses which carry out statistics processing of the measurement information, such as travel-time information transmitted from the move terminal 30.
[0028] In the move terminal 30, the means of communications to which 27 communicates with road-side equipment 25 or an information centre 16 with radio, a wire communication, data broadcasting, or satellite communication, an information-display means to display the information which 28 received from road-side equipment 25 or the information centre 16, and 29 are measurement meanses to measure travel-time information etc. In addition, the supply means indicated by the claim 1 is realized by the information-compression means 14 and means of communications 15, and the traffic information supply means is realized here by the compound map information creation means 22 and means of communications 18.
[0029] Next, operation is explained. In an information centre 16, the road map information management means 11 updates the road map information stored in the road map information-storage means 12, when the map information within a jurisdiction has change. Therefore, in the road map information-storage means 12, road map information is always held at the newest state.
[0030] The information gathering means 10 collects passage related information including information, such as road traffic information, such as traffic congestion and accident, construction, regulation, and a road surface situation. For example, in order to grasp a traffic situation, the sensor or metering device which detects the amounts of many [traffic] (it is the number of vehicles, speed, traffic congestion, a travel time, etc., and it names generically here and is called road traffic information), such as a sensor and a travel-time metering device, is installed in the passage. The road traffic information detected by the sensor or the metering device is brought together in a control center through a public line etc. It is brought together in a control center, and road traffic information is collected by nonprofit foundation like a traffic information centre in order to present various services. The information gathering means 10 receives for example, road traffic information from a traffic information centre.
[0031] The measurement means 29 of the move terminal 30 measures information, such as a travel time. The measurement means 29 transmits the identification information of other road-side equipments 25 or positional information which passed immediately before, and the hour entry which the run from the position of the road-side equipment 25 passed just before to the current position took through means of communications 27 to road-side equipment 25. In the road-side equipment 25

which received those information, the move terminal measurement information processing means 24 recognizes a travel time in the meantime from the hour entry of the run to the installation position of other road-side equipments 25 to the self-equipment which identification information or positional information shows. Moreover, the move terminal 30 memorizes the identification information or positional information of road-side equipment 25 which received from the road-side equipment 25 passed this time, and carries out information transmission similarly to the road-side equipment 25 passed next time. The move terminal measurement information processing means 24 in road-side equipment 25 performs statistics processing etc. to the measurement information from each move terminal 30, and transmits a processing result to an information centre 16 through means of communications 17. Thus, the amount of data transmitted to an information centre 16 is cut down by performing statistics processing etc.

[0032] In an information centre 16, it is received by means of communications 15, and the information from the move terminal measurement information processing means 24 is sent to the information gathering means 10. The information gathering means 10 also includes the sent measurement information in passage related information.

[0033] The local passage related information processing means 13 changes the passage related information which the information gathering means 10 collected into the information which can be used at the move terminal 30. For example, matching with Links (for example, intercept from a crossing to the next crossing) 31A, 31B, and 31C and the traffic congestion information 32A, 32B, and 32C that a number was assigned on the passage network is performed. That is, the sign which shows the degree of the traffic congestion beforehand determined as the link number is matched. Thus, the traffic congestion information in passage related information is changed into the information which shows how many which links are congested. The local passage related information processing means 13 matches those information and link numbers about accident, regulation information, etc. in passage related information using the sign which shows the information classification defined beforehand, a degree, a position, etc.

[0034] Furthermore, the local passage related information processing means 13 supplies the passage related information and the road map information within the limits which each road-side equipment 25 within a jurisdiction of an information centre 16 processed as mentioned above should manage to each road-side equipment 25 through the information-compression means 14 and means of communications 15. About passage related information, it is the frequency according to the frequency of information gathering in here, for example, transmits to each road-side equipment 25 by 1 time of frequency in 5 minutes. About road map information, it is the frequency according to the frequency of updating, for example, transmits in three months by 1 time of frequency.

[0035] The information-compression means 14 performs amount-of-information curtailment of the information transmitted to each road-side equipment 25. If making each road-side equipment 25 hold a map database etc. shares data between an information centre 16 and each road-side equipment 25, amount-of-data curtailment can be performed as follows. That is, when transmitting road map information and updating or an addition of map information is made, the information which specifies the configuration for displaying the link number and link of the link set as the object of updating or an addition is transmitted. When deletion of map information is made, only the link number of the link for deletion is transmitted. About information, such as the name of a place and a route name, since there is no need for change unless there are updating and an addition, it does not transmit. When transmitting passage related information, it does not transmit about the display position of event information, such as traffic congestion and construction. A display position is because it is good for every link in a fixed position. Only the information on difference with the information transmitted last time is transmitted about the passage related information itself.

[0036] The information-compression means 14 performs the informational information compression which carried out information curtailment as mentioned above. For example, run length coding etc. performs an information compression. Means of communications 15 makes the gestalt which can be transmitted road map information and passage related information after the information-compression means 14 performs curtailment and compression of the amount of data, and transmits to each road-side equipment 25. Thus, by performing curtailment and compression of the amount of data, the amount of transmissions between an information centre 16 and road-side equipment 25 is cut down.

[0037] In each road-side equipment 25, means of communications 17 receives the information sent from an information centre 16, and sends it to the information restoration means 19. After the information restoration means 19 decodes the information when road map information is received, and the information compression of the information is carried out by coding, when the information compression of it is not carried out, it is sent to the local road map information management means 20 as it is. The local map information management means 20 updates the road map database within the local road map information-storage means 21 using the sent information.

[0038] The information restoration means 19 decodes the information, when passage related information is received, and the information compression of the information is carried out by coding. And as shown in drawing 3 , while changing information classification, degrees, etc., such as traffic congestion and accident, into the data for a display expressed as the traffic congestion signs 33, 34, and 35 or an accident sign 36, it notifies having received passage related information to the compound map information creation means 22. The compound map information creation means 22 will read road map information from the local road map information-storage means 21 through the local map information management means 20, if it knows having received passage related information. And the passage related information changed into the data for a display is superimposed on road map information, and compound map information is created. Compound map information is stored in the compound map information-storage means 23. The local map information management means 20 will read compound map information from the compound map information-storage means 23, if the data demand information from the move terminal 30 is received through means of communications 18. And compound map information is sent to means of communications 18. Means of communications 18 is made into the gestalt which can transmit the received compound map information, and transmits to each move terminal 30.

[0039] In the move terminal 30, means of communications 27 sends the information which received compound map information and was received to the information-display means 28. The information-display means 28 displays the received information on display, such as a display.

[0040] As mentioned above, according to this example, the compound map information based on a detailed local map is supplied to each move terminal 30, without making the amount of data transmitted between an information centre 16 and

each road-side equipment 25 increase. Therefore, even if it is the case where the move terminal 30 does not hold the map database, detailed map information can be acquired. Moreover, the newest road map information will be stored in the local road map information-storage means 21 of road-side equipment 25, and even if the content of the map database which the move terminal 30 has is old, exact compound map information is displayed on display.

[0041] Example 2. drawing 4 is the block diagram showing the traffic information offer structure of a system by the 2nd example of this invention. The traffic information offer system by this example creates path guidance information, supplies what was superimposed on road map information by using as a guide passage way view the path guidance information which corresponds to the move terminal which required the path guidance to the destination from an origin, and enables it to display what superimposed the guide passage way view on road map information in the move terminal.

[0042] In the information centre 41 in the passage infrastructure 47 shown in drawing 4 , 40 is an optimal-path search means to search for the optimal path from the link in which each road-side equipment within a jurisdiction is installed to each of other link using the passage related information supplied from the road map information and the information gathering means 10 which are supplied from the road map information management means 11. An optimal path is a path which can be passed by the minimum travel time. An information restoration means by which 42 has the restoration function of path guidance information with the restoration function of the information restoration means 19 in the 1st example in road-side equipment 46, A guide passage way view creation means by which 43 creates a guide passage way view based on the information on an optimal path that each of other link is reached, from a self-equipment installation link, A guide passage way view information-storage means to store the guide passage way view where 44 was created, and 45 are compound path guidance information creation meanses to send the information which superimposed the guide passage way view on road map information according to the demand of the path guidance information from the move terminal 49 to means of communications 18. In the move terminal 49, 48 is a data setting means for setting up the destination and requiring path guidance information.

[0043] Next, operation is explained. The optimal-path search means 40 searches for the path which can be passed by the minimum travel time from the link in which road-side equipment 46 is installed by making the travel time of for example, each link into link cost to each of other link. What is necessary is to consider as path planning, for example, just to use a well-known Dijkstra method. The optimal-path search means 40 searches for the optimal path over all other links within a jurisdiction from the link in which a certain road-side equipment 46 is installed. And this optimal-path search is performed for all the road-side equipments 46 within a jurisdiction. In addition, since various methods are learned as the path planning technique, it is good to use the optimal technique according to the occasional road situation.

[0044] Drawing 5 shows the expression method of the road network for optimal-path search. As shown in drawing, it considers as the origin and destination for optimal-path search of a link, and the road network is expressed as changes to the link from a link. If a road network is expressed by changes between links, the optimal-path search which took in the right and left chip box cost in a crossing will be attained. Weighting which is different from right and left chip box cost to cost by the case which turns to the right where it case and turns left when going a certain crossing straight on is performed. Moreover, generally, since the destination is not a crossing but some point on a link, it is significant on path guidance. [of making a link into the destination]

[0045] Drawing 6 shows an example as a result of optimal-path search. Drawing 6 shows that each optimal path from a certain optical sensor installation link, i.e., a road-side equipment installation link, to all other links was acquired as tree information. And the optimal-path search means 40 obtains the result of optimal-path search about all the road-side equipment installation links within a jurisdiction. Each search result is transmitted to each road-side equipment 46 through the information-compression means 14 and means of communications 15 as path guidance information.

[0046] On the occasion of transmission of path guidance information, curtailment of the amount of transmissions can be aimed at as follows. That is, the link number (relative number) managed every road-side equipment 46 is used for the information-compression means 14, without using the number (absolutely number) to which a number was assigned to passage networks all over the country as a link number. A relative number is a number when assigning a number to each link in the jurisdiction field of each road-side equipment 46 sequentially from 0. The amount of data transmitted since the number of digits of a number will become small compared with the case where a number is used absolutely, if a relative number is used is cut down. In addition, the information-compression means 14 performs conversion for a relative number from a number absolutely by holding the table which matched the number and the relative number for example, with each road-side equipment 46 correspondence absolutely, and referring to the table.

[0047] Moreover, in order to cut down the amount of data of path guidance information, the number of the links set as the target object at the time of optimal-path search is decreased. Specifically, the link which exists far away is degenerated. Degeneracy of a link is performed as follows, for example. First, it hierarchizes in the procedure in which a passage network is shown in drawing 7 . That is, it hierarchizes in the following procedures.

1. Define each crossing of detailed road map level as a primary crossing. Each link to which a each primary crossing is connected is defined as a primary link.

2. Choose one important typical crossing on road traffic from some adjoining primary crossings, and consider as a secondary crossing. In addition, a secondary crossing is also a primary crossing. Selection of a secondary crossing is also automatable using passage classification or traffic.

Between the 3.2nd crossing and the secondary crossing of the near, the distance shortest path planning is performed using a primary link, and the shortest path is considered as a secondary link. In path planning, right and left chip box cost is also taken into consideration. Moreover, weighting by passage classification is performed so that a trunk road may be easy to be chosen as a secondary link.

4. Choose one typical crossing from some adjoining secondary crossings, and consider as the 3rd crossing. In addition, the 3rd crossing is also a secondary crossing. Selection of the 3rd crossing is also automatable using passage classification or traffic.

Between the 5.3rd crossing and the 3rd crossing of the near, the distance shortest path planning is performed using a primary link, and the shortest path is considered as the 3rd link. In path planning, right and left chip box cost is also taken into consideration. Moreover, weighting by passage classification is performed so that a trunk road may be easy to be chosen as

3rd link.

6. Repeat the above-mentioned procedure and obtain the n-th crossing and the n-th link.

[0048] Next, the optimal-path search means 40 creates a degeneracy road network for example, using a secondary mesh using the crossing and link expression which were obtained by the above-mentioned procedure and which were hierarchized. A secondary mesh is the sample-plot region mesh appointed by the Administrative Management Agency notification No. 148 in Showa 48. The thing which makes a primary mesh each partition at the time of dividing in the direction of the LAT and dividing the Japan whole country in the direction of LONG at intervals of 1 time for 40 minutes and by which 8 ****s of primary mesh were made east and west and north and south, respectively is a secondary mesh. And as shown in drawing 8 , a secondary mesh including the link used as the origin for optimal-path search is made into a secondary criteria mesh, and the inside of secondary criteria a mesh and the secondary mesh of the near is expressed by the primary crossing and the primary link. Furthermore, it expresses by the high order crossing and the link as the inside of the secondary mesh of the circumference of it is expressed by the secondary crossing and the secondary link and the range is expanded. A degeneracy road network as shown in drawing 9 is created by the above operation. And if the optimal-path search means 40 performs optimal-path search for a degeneracy road network, since the number of links which may serve as a destination will be cut down, the amount of data of path guidance information is cut down.

[0049] In road-side equipment 46, the information restoration means 42 will extract the optimal-path information to each link which makes self-equipment an origin, if path guidance information as shown in drawing 6 through means of communications 17 is received. And the extracted optimal-path information is sent to the guide passage way view creation means 43. When the link number is expressed by the relative number in path guidance information, it changes into a number absolutely using a translation table. The guide passage way view creation means 43 changes each optimal-path information for reaching each link into each indicative data using the sign expression for path guidance. And it stores in the guide passage way view information-storage means 44 by using those data as each guide passage way view. Moreover, it registers with the look-up table as a candidate for reference.

[0050] The user of the move terminal 49 sets the destination as the data setting means 48 in code in which a number was assigned for every every place region when path guidance information was required. Means of communications 27 transmits a demand of path guidance information including the information which shows the set-up destination to road-side equipment 46. In road-side equipment 46, the compound path guidance information creation means 45 will read the guide passage way view about the link applicable to the destination from the guide passage way view information-storage means 44, if a demand of the path guidance information from the move terminal 49 is received through means of communications 18. Moreover, road map information is read from the local road map information-storage means 21 through the local road map information management means 20. And a guide passage way view is superimposed on road map information, and it sends to means of communications 18 by making into path guidance information what was superimposed. When there is a specified destination out of range [a road map], after adding to road map information the information which carries out character representation of the name of a place of the destination etc. to the part which hits in the direction of the destination in the portion of the edge for example, on a road map, it sends to means of communications 18 by making road map information into path guidance information. If it does in this way, a user can be told about having guided the path to the destination certainly. Means of communications 18 is made into the form which can transmit the received path guidance information, and transmits to the move terminal 49.

[0051] The means of communications 27 of the move terminal 49 will send the information to the information-display means 28, if path guidance information is received. The information-display means 28 displays the received information on display, such as a display. The user of the move terminal 49 can receive the path guidance information corresponding to the own demand as mentioned above from road-side equipment 46.

[0052] Example 3. drawing 10 is the block diagram showing the traffic information offer structure of a system by the 3rd example of this invention. As shown in drawing, this traffic information offer system contains the road-side equipment 51 with which the compound map information creation means 22 and the compound map information-storage means 23 were added, it replaced with the compound path guidance information creation means 45 to the composition of the road-side equipment 46 in the 2nd example, and the compound path guidance information creation means 50 with road related information was established. The compound path guidance information creation means 50 with road related information superimposes road related information on path guidance information.

[0053] Next, operation is explained. The compound map information creation means 22 will read road map information from the local road map information-storage means 21 through the local map information management means 20, if it knows having received road related information from the information centre 41 like the case of the 1st example. And the road related information changed into the data for a display is superimposed on road map information, and compound map information is created. Compound map information is stored in the compound map information-storage means 23. The guide passage way view creation means 43 changes each optimal-path information for reaching each link as well as the case of the 2nd example into each indicative data using the sign expression for path guidance. And it stores in the guide passage way view information-storage means 44 by using those data as each guide passage way view.

[0054] The compound path guidance information creation means 50 with road related information will read the guide passage way view about the link applicable to the destination from the guide passage way view information-storage means 44, if a demand of the path guidance information from the move terminal 49 is received through means of communications 18. Moreover, compound map information is read from the compound map information-storage means 23. And a guide passage way view is superimposed on compound map information, and it sends to means of communications 18 by making into path guidance information what was superimposed. Means of communications 18 is made into the form which can transmit the received path guidance information, and transmits to the move terminal 30.

[0055] Since compound map information is superimposed on road related information by road map information, in this case, road related information is also added to path guidance information. therefore, the situation of a path that a user is guided has become what -- it can recognize a thing

[0056] Example 4. drawing 11 is the block diagram showing the traffic information offer structure of a system by the 4th example of this invention. As shown in drawing, this traffic information offer system contains the road-side equipment 63

with which the information logging means 62 was added to the composition of the road-side equipment 51 in the 3rd example including the information centre 61 in which it replaced with the local road related information processing means 13 of the information centre 41 in the 3rd example, and the road related information processing means 60 was formed. Although control whose local road related information processing means 13 supplies road related information and road map information to each road-side equipment correspondence was performed in each above-mentioned example, in addition to it, the road related information processing means 60 in this example performs control which supplies the road related information and the road map information of the whole jurisdiction region on an information centre 61. Moreover, the information logging means 62 is established between means of communications 17 and the information restoration means 42, and only the information about the jurisdiction field of self-equipment is extracted from the information on the whole jurisdiction region transmitted from the information centre 61.

[0057] Next, operation is explained. In this case, for example, each road-side equipment 63 also holds a map database. Moreover, each road-side equipment 63 holds the link number of each link in the field self-equipment has jurisdiction [field]. If the road related information processing means 60 outputs the road map information on the whole jurisdiction region of an information centre 61, the information-compression means 14 will send the information which specifies the configuration for displaying the link number and link of the link which had updating and the addition in road map information, and the link number of a link deleted to means of communications 15. Means of communications 15 carries out multiple address transmission of the received information using an FM multiplex broadcast.

[0058] In each road-side equipment 63, means of communications 17 will be sent to the information logging means 62, if the information from an information centre 61 is received. The information logging means 62 incorporates only the information about the link self-equipment has jurisdiction [link] among the sent information. The information logging means 62 sets a road map by the range performs clipping if needed and self-equipment has jurisdiction [range].

[0059] Or as shown in drawing 12 , the road related information processing means 60 divides the road map information in the jurisdiction region of an information centre 61 into the road map information for every jurisdiction field of each road-side equipment 63, and outputs each division road map information one by one. Means of communications 15 carries out multiple address transmission of the received information one by one using an FM multiplex broadcast. At this time, the identification number of each field, for example, the absolute-coordinate position and field number of an upper left corner of a field, is added as header information to each division road map information. In each road-side equipment 63, the information logging means 62 performs skip processing until the information on the jurisdiction field of self-equipment is transmitted referring to header information. And detection of the header information which shows the information on the jurisdiction field of self-equipment incorporates information from there.

[0060] As well as the case where road map information is transmitted when transmitting road related information, you may perform multiple address transmission. That is, if the road related information processing means 60 outputs road related information with the link number corresponding to it, means of communications 15 will carry out multiple address transmission of those information using an FM multiplex broadcast. The information logging means 62 of each road-side equipment 63 incorporates only the information about the link self-equipment has jurisdiction [link] among each received information. Or multiple address transmission of the road related information for every field shown in drawing 12 is carried out one by one with a field number, and you may make it the information logging means 62 of each road-side equipment 63 choose required information with reference to a field number.

[0061] You may be made to carry out multiple address transmission from an information centre 61 also about path guidance information. In this case, the optimal-path search means 40 adds the header information which shows whether it is the path guidance information which makes which road-side equipment 63 an origin to the path guidance information which made each road-side equipment 63 the origin. Means of communications 15 carries out multiple address transmission of those information using an FM multiplex broadcast. In each road-side equipment 63, the information logging means 62 performs skip processing until the information on the jurisdiction field of self-equipment is transmitted referring to header information. And detection of the header information which shows the information on the jurisdiction field of self-equipment incorporates information from there.

[0062] As mentioned above, an information centre 61 carries out multiple address transmission of at least one of road map information, road related information, and path guidance information at each road-side equipment 63, and if road-side equipment 63 starts the information about the jurisdiction field of self-equipment and it is made to receive, the processing by the side of an information centre 61 will be simplified. Moreover, mitigation of the communication load by distribution of the amount of transmissions of the information between an information centre 61 and road-side equipment 63 can be aimed at. In addition, the information-compression means 14 performs the information compression of each information, and you may make it, transmit the information by which the information compression was carried out also in this case, of course. Moreover, although the case where FM multiplex transmitter was used as means of communications 15 which is information offer media here was explained, as long as information offer media can perform multiple address transmission, other things are sufficient as them. In this case, what is necessary is just to prepare a considerable thing as means of communications 17 of road-side equipment 63.

[0063] Example 5. drawing 13 is the block diagram showing the traffic information offer structure of a system by the 5th example of this invention. An information gathering means by which 10 collects road related information in an information centre 71, A road map information management means to perform updating management of the road map information within a jurisdiction that 11 is stored in the road map information-storage means 12, The road related information processing means as the thing in the 4th example by which 60 is the same, the information compression of the information to which 14 is outputted from the road related information processing means 13 and an information-compression means to perform information curtailment, and 15 are means of communications for performing communication with road-side equipment 74.

[0064] The means of communications for 17 communicating with an information centre 71 in each road-side equipment 74, The means of communications for 18 communicating with the move terminal 78, an information restoration means to restore the information to which the information compression of 42 was carried out from the information centre 16, A local road map information management means to perform updating management of the road map information which 20 received, A local road map information-storage means to store the road map information for which updating management of 21 is carried

out by the local road map information management means 20, The local road related information management tool which performs updating management of the road related information which 72 received, and 73 are local road related information storage meanses to store the road related information by which updating management is carried out with the local road related information management tool 72.

[0065] In the move terminal 78, the means of communications for 27 performing communication with an information centre 71 and road-side equipment 74, an information logging means to perform the processing as the information logging means 62 in the 4th example that 76 is the same, an information restoration means to restore the information to which the information compression of 77 was carried out from an information centre 71 or road-side equipment 74, and 28 are information-display meanses.

[0066] The traffic information offer system by this example carries out multiple address transmission of the road map information, and by each move terminal 78 side, an information centre 71 starts required road map information, and receives it so that clearly from the above composition.

[0067] Next, operation is explained. An information centre 71 carries out multiple address transmission of the road map information on a jurisdiction region using an FM multiplex broadcast like the case of the above-mentioned example. The road related information processing means 60 sends the information which shows alphabetic information, those display positions, etc., such as information which specifies the configuration for displaying the link number of a link, and its link, and the name of a place, a route name, to means of communications 15 in consideration of the case where the move terminal 78 does not hold the map database. Means of communications 15 carries out multiple address transmission of those information. Moreover, the road related information processing means 60 performs control which transmits the road related information in the jurisdiction field of each road-side equipment 75 to each road-side equipment 75 like the case of the 1st example.

[0068] In each road-side equipment 74, if means of communications 17 receives road related information, the local road related information management tool 72 stores road related information in the local road related information storage means 73 as an indicative data. If means of communications 18 receives a demand of information from the move terminal 78, the local road related information management tool 72 will read the road related information stored in the local road related information storage means 73, will start it with road related information, and will send information to means of communications 18. Means of communications 18 transmits those information to the move terminal 78. Here, logging information is information for the move terminal 78 starting a required portion from the road map information received from an information centre 71, for example, is the link number of each link in the jurisdiction field of the road-side equipment which road-side equipment 74 holds.

[0069] In the move terminal 78, when means of communications 27 receives road related information and logging information, logging information is saved in the information logging means 76, and road related information is saved in the information-display means 28. If means of communications 18 receives road map information from an information centre 71, the information logging means 76 will start the road map information on surrounding with reference to logging information in the end of a local, and will send it to the information restoration means 77. The information restoration means 77 restores information, when it is the information by which receipt information was encoded. And the restored information is sent to an information display 28. An information display 28 superimposes and displays the saved road related information on road map information.

[0070] The road related information processing means 60 divides the road map information in the jurisdiction region of an information centre 71 into the road map information for every jurisdiction field of each road-side equipment 74, and you may make it output each division road map information one by one in an information centre 71, as shown in drawing 12 . At this time, the absolute-coordinate position and field number of an upper left corner of a field are added as an identification number of each field to each division road map information. When it is made such, even if it starts the information logging means 76 of the move terminal 78 from road-side equipment 74 and it does not receive informational supply, it can start road map information with reference to the identification number of each field.

[0071] Even when according to this example the communication load between road-side equipment 74 and the move terminal 78 can be reduced, the channel capacity between road-side equipment 74 and the move terminal 78 has a limit and road map information cannot be transmitted, the move terminal 78 can acquire detailed map information.

[0072] Example 6. drawing 14 is the block diagram showing the traffic information offer structure of a system by the 6th example of this invention. As shown in drawing, the information centre 61 in this example has the information gathering means 10 and the road related information processing means 60 which it already explained, the optimal-path search means 40, the road map information management means 11, the road map information-storage means 12, the information-compression means 14, and means of communications 15. Road-side equipment 81 has the means of communications 17 which was already explained, the information logging means 62, the information restoration means 42, the local road map management tool 20, the local road map information-storage means 21, the local road related information management tool 72, the local road related information storage means 73, the guide passage way view creation means 43, the guide passage way view information-storage means 44, and means of communications 18. Road-side equipment 81 has the information offer control means 80 which create the information with which inputs road map information, road related information, and path guidance information, and the move terminal 84 is provided further. The move terminal 84 has the means of communications 27 which was already explained, the data setting means 48, the information logging means 76, and the information restoration means 77. In this case, the move terminal 84 has the information display and the control means 83 which perform the display according to the kind of received information further. The traffic information offer system by this example specifies required information from the move terminal 84, and can supply the information according to specification to the move terminal 84 from the road infrastructure 82.

[0073] Next, operation is explained. In an information centre 61, the road related information processing means 60 and the optimal-path search means 40 transmit road map information, road related information, and path guidance information as well as the case of the 1st example or the 2nd example to road-side equipment 81 or the move terminal 84 through the information-compression means 14 and means of communications 15. The road related information processing means 60 also performs control which carries out multiple address transmission like the case of the 4th example about road related

information.

[0074] In road-side equipment 81, it is received through means of communications 17 and the information logging means 62, and the information from an information centre 61 as well as the case of the 1st - the 4th example is restored with the information restoration means 42. The local road map management tool 20 stores road map information in the local road map information-storage means 21 like the case of the 1st example or the 2nd example. The guide passage way view creation means 43 stores path guidance information as well as the case of the 2nd example or the 3rd example in the guide passage way view information-storage means 44. The local road related information management tool 72 stores road related information in the local road related information storage means 73 like the case of the 5th example.

[0075] The user of the move terminal 84 sets up the code which shows the information classification (road map information, road related information, or path guidance information) to need using the data setting means 48. In requiring path guidance information, it also sets up the code which shows the destination. The set-up information is transmitted to road-side equipment 81 by means of communications 27. Moreover, about road related information, package specification of related information can be performed and specification of specific information, such as traffic congestion information and regulation information, can also be performed, for example.

[0076] A demand of the information from the move terminal 84 is inputted into the information offer control means 80 through the means of communications 18 of road-side equipment 81. The information offer control means 80 will read required information through the local road map management tool 20, the local road related information management tool 72, or the guide passage way view creation means 43 according to the information classification specified by the demand, if a demand of information is inputted. The information offer control means 80 add the logging information for starting the criteria positional information and road related information of an upper left corner of a point, such as an absolute-coordinate value, when road map information is read. [of the road map information] Logging information is the same as what was explained in the 4th example. When road related information or path guidance information is read, criteria positional information is added. Means of communications 18 transmits the information to which criteria positional information etc. was added to the move terminal 84.

[0077] If the means of communications 27 of the move terminal 84 receives the information from road-side equipment 81 and it is required, after the information logging means 76 starts information, it is sent to the information restoration means 77. The information restoration means 77 sends the restored information to an information display and control means 83. An information display and control means 83 hold the criteria positional information added while displaying the information, if road map information is received. In this case, the road related information and the path guidance information from road-side equipment 81 are not superimposed with road map information. Therefore, if road related information is received, an information display and control means 83 test the criteria positional information added to it, and the criteria positional information currently held by comparison, and after they perform alignment of road related information and road map information, they will indicate by superposition. If path guidance information is received, the criteria positional information added to it and the criteria positional information currently held are tested by comparison, and after performing alignment of path guidance information and road map information, it will indicate by superposition.

[0078] Example 7. drawing 15 is the block diagram showing the traffic information offer structure of a system by the 7th example of this invention. As shown in drawing, the information centre 71 in this example has the information gathering means 10 and the local road related information processing means 13 which it already explained, the road map information management means 11, the road map information-storage means 12, the information-compression means 14, and means of communications 15. Road-side equipment 91 has the means of communications 17 which was already explained, the information restoration means 42, the local road map management tool 20, the local road map information-storage means 21, the local road related information management tool 72, the local road related information storage means 73, and means of communications 18. The move terminal 95 has the means of communications 27 which was already explained, the data setting means 48, the information logging means 76, the information restoration means 77, and an information display and control means 83. In this case, the move terminal 84 has the information-requirements control means 94 which determine demand information automatically further according to the relation between the range of a self-vehicle position detection means 93 to detect the self-vehicle position under run, and the received road map information, and a self-vehicle position.

[0079] Next, operation is explained. An information centre 71 provides road-side equipment 91 with road map information and road related information by the same processing as the case of the 1st example etc. In road-side equipment 91, road map information is stored in the local road map information-storage means 21, and road related information is stored in the local road related information storage means 73.

[0080] In the move terminal 95, an information display and control means 83 hold the criteria positional information added while displaying the information, if road map information is received like the case of the 6th example. According to a setup of the data setting means 48, the information offer means 80 of road-side equipment 91 offers road map information.

[0081] For example, a GPS receiver realizes and the self-vehicle position detection means 93 of the move terminal 95 detects the absolute coordinate of a self-vehicle position. The information-requirements control means 94 compare the criteria positional information currently held at an information display and control means 83 with the detected absolute coordinate. For example, when criteria positional information is expressed with the absolute-coordinate value of the point of the upper left corner of road map information, it can judge whether it exists whether a self-vehicle position exists in a part for the center section in road map information by comparison in a part for a periphery. When it judges with existing in a part for a periphery, the information which requires different road map information from the map displayed now is sent to means of communications 27. If the map displayed now is overlapped on road related information when it exists in a part for a center section, since it is useful, the information which requires road related information is sent to means of communications 27. In addition, the judgment of whether it exists in a part for a center section or to exist in a part for a periphery should just perform a central field and the other portion for the central portion of 3x3 as a circumference field, when the range for example, of road map information is divided into the subsection of 5x5.

[0082] Means of communications 27 transmits demand information to road-side equipment 91. The information offer means 80 of road-side equipment 91 supplies road map information or road related information to the move terminal 95 according to a demand.

[0083] As mentioned above, in the traffic information offer system by this example, the move terminal 95 requires automatically the required information of road map information and the road related information according to a self-vehicle position. Therefore, generating useless information requirements is reduced.

[0084] Example 8. drawing 16 is the block diagram showing the traffic information offer structure of a system by the 8th example of this invention. As shown in drawing, the composition by the side of the road infrastructure 92 in this traffic information offer system is the same as the composition in the 7th example. The move terminal 102 is replaced with the self-vehicle position detection means 93 in the 7th example, it has the renewal history management tool 100 of information which performs updating management of road related information, and the information-requirements control means 101 will generate the demand of road related information automatically, if it is detected in this case that road related information is not updated more than fixed time.

[0085] Operation of an information centre 71 and road-side equipment 91 is the same as operation of the 7th example. For example, timer equipment realizes, and the renewal history management tool 100 of information is reset whenever the move terminal 102 receives road related information. And a signal will be outputted if a certain fixed time (for example, 30 minutes) is clocked after reset. If the signal from the renewal history management tool 100 of information is received, the information-requirements control means 101 will give instructions so that an information centre 71 may be called and the demand information on road related information may be transmitted to the mobile phone in means of communications 27. A mobile phone calls an information centre 71 according to it.

[0086] The mobile phone in the means of communications 15 of an information centre 71 will send road related information to the mobile phone of the move terminal 102, if a demand is received from the move terminal 102. In an information display and control means 83, it is superimposed on the sent road related information with road map information, and it is displayed. In addition, in case the demand of road related information is given to an information centre 71, it transmits simultaneously and starts from an information centre 71, and you may make it receive supply of the road related information of the range according to information, offer of the road related information for multiple address transmission in the 4th example is received, without transmitting logging information, and you may make it logging information also start the road related information of the required range with the information logging means 76. When the information offer control means 80 of road-side equipment 91 provide the move terminal 102 with road map information, the logging information then used is offered simultaneously and held at the information logging means 76.

[0087] As mentioned above, according to the updating situation of road related information, the move terminal 102 requires road related information, and the traffic information offer system by this example can always prepare now the newest road related information in the move terminal 102.

[0088] Example 9. drawing 17 is the block diagram showing the traffic information offer structure of a system by the 9th example of this invention. As shown in drawing, the composition of the road infrastructure 82 is the same as the composition in the 6th example. In this case, the move terminal 111 has the self-vehicle position detection means 93 and the renewal history management tool 100 of information. Therefore, the information-requirements control means 110 perform demand control of required information automatically in this case according to the self-vehicle position on road map information, and the updating situation and run situation of road related information. That is, although the move terminal 95 performed information requirements only based on the self-vehicle position of road map information and the 8th example performed information requirements only based on the updating situation of road related information in the 7th example, in this example, information requirements can be performed based on the both sides of a self-vehicle position and the renewal situation of information, and the move terminal 111 can acquire required information still more flexibly.

[0089] Next, operation is explained. Operation of an information centre 61 and road-side equipment 81 is the same as operation of the 6th example. Selection demand control with the road map information based on the self-vehicle position on the road map information in the move terminal 111 and road related information is the same as that of the case of the 7th example, and the information-requirements control based on the updating situation of road related information is the same as that of the case of the 8th example.

[0090] Here, the information-requirements control means 110 perform selection demand control with road map information and road related information, after the destination is further set up in the data setting means 48, in order to require path guidance information. That is, processing shown in the flow chart of drawing 18 is performed. If supply of road map information is not received from road-side equipment 81 yet, the demand information is made to transmit to means of communications 27. According to a demand, road map information is supplied from road-side equipment 81. (Steps ST11 and ST12) . If supply of road related information is not received, the demand information is made to transmit to means of communications 27. According to a demand, road related information is supplied from road-side equipment 81 (Steps ST13 and ST14).

[0091] And when the self-vehicle has not reached near the destination yet, the information-requirements control means 110 check whether the self-vehicle has reached a part for the periphery in road map information (Steps ST15 and ST16). A judgment whether it is near the destination is made by comparing the absolute coordinate of the self-vehicle position by the self-vehicle position detection means 93 with the absolute coordinate corresponding to the destination code. Moreover, it is judged by comparison with the absolute coordinate corresponding to the criteria positional information added to road map information, and the absolute coordinate of the self-vehicle position by the self-vehicle position detection means 93 whether a part for a periphery was reached. When a part for a periphery is reached, the information-requirements control means 110 make the demand information on new road map information transmit to means of communications 27 (step ST 17). Moreover, road related information checks whether it is the newest thing (step ST 18). Road related information is judged by whether the time passed, when road related information supplies [the information centre 61] in 5 minutes whether it is the newest thing to road-side equipment 81 by 1 time of frequency. If it is not the newest thing, the information-requirements control means 110 will make the demand information on road related information transmit to means of communications 27 (step ST 19).

[0092] When a self-vehicle is near the destination, as for the information-requirements control means 110, road related information checks whether it is the newest thing (Steps ST15 and ST20). If it is not the newest thing, the information-requirements control means 110 will make the demand information on road related information transmit to

means of communications 27 (step ST 21).

[0093] As mentioned above, when the destination for path guidance information requirements is already set up, the information-requirements control means 110 are controlled so that priority is given to a demand of road map information when a self-vehicle approaches the destination, and a self-vehicle gives priority to renewal of passage related information during a run the middle.

[0094] Example 10. drawing 19 is the block diagram showing the traffic information offer structure of a system by the 10th example of this invention. As shown in drawing, the composition of the road infrastructure 71 is the same as the composition in the 8th example. In this case, in addition to the means of communications 27 which was already explained, the data setting means 48, the information logging means 76, the information restoration means 77, an information display and control means 83, and the self-vehicle position detection means 93, the move terminal 123 has the terminal road map management tool 120 which manages the received road map information, and a terminal road map storage means 121 to store the road map information for two or more sheets. Moreover, when road map information [need / in this case / the information-requirements control means 122 / the move terminal 123 / for the present run] is not held, it also has the function to require required road map information. That is, the information-requirements control means 122 also realize the function of the information-requirements generating means indicated by the claim 10.

[0095] Next, operation is explained. Operation of an information centre 71 and road-side equipment 91 is the same as operation of the 8th example. The terminal road map management tool 120 stores in the terminal road map storage means 121 the road map information received from road-side equipment 91 one by one. Therefore, two or more road map information received by present is stored in the terminal road map storage means 121.

[0096] During a run, the information-requirements control means 122 acquire the absolute-coordinate value of a self-vehicle position from the self-vehicle position detection means 93, and send it at the terminal road map management tool 120. The terminal road map management tool 120 searches road map information to which a self-vehicle position is located near a center from the terminal road map storage means 121 based on the coordinate value. When such road map information is found, the road map information is displayed on an information display and control means 83. When not found, that is notified to the information-requirements control means 122. The information-requirements control means 122 make the demand for making road map information to which a self-vehicle position is located near a center supply transmit to means of communications 27. The information offer control means 80 of the road-side equipment 91 which received the demand make the corresponding road map information transmit to means of communications 18.

[0097] In addition, the terminal road map management tool 120 has memorized the criteria positional information added to each road map information. Criteria positional information is the absolute-coordinate value of the point of an upper left corner, as already explained. Since the size of the map which each road map information shows is known, the terminal road map management tool 120 can judge whether a self-vehicle position is located near a center by comparing criteria positional information and a size with a self-vehicle position.

[0098] As mentioned above, since it will be utilized if it searches from the road map information to which the move terminal 123 received road map information to which a self-vehicle position is located near a center until now and there is such information, the information requirements from the move terminal 123 to road-side equipment 91 are reduced.

[0099] In the 5th example shown in example 11. drawing 13 , multiple address transmission of the road map information with a detailed information centre 71 was carried out by the FM multiplex broadcast, and the move terminal 78 started, the road map information on surrounding was started with reference to information in the end of a local, and it had received. However, it can also constitute so that road map information (difference road map information) only including the link of the level which does not fill for example, general all-prefectures level with the passage related information processing means 60 of an information centre 71 as information for carrying out multiple address transmission by the FM multiplex broadcast may be outputted, and so that the road map information (simple road map information) which includes only the link of the level more than general all-prefectures level as information which carries out individual transmission may be outputted to each road-side equipment 74. Road-side equipment 74 supplies simple road map information to the move terminal 78 through means of communications 18. At this time, logging information is also supplied to the move terminal 78.

[0100] When an information centre 71 is constituted as mentioned above, the information-display means 28 of the move terminal 78 displays the simple road map information received from road-side equipment 74 through means of communications 27. the case where detailed road map information is needed -- means of communications 27 -- the difference from an information centre 71 -- road map information is received And the information-display means 28 inputs the simple road map information on surrounding in the end of a local which the information logging means 76 started and was started using information, and indicates it by superposition at simple road map information.

[0101] According to this example, road map information is divided into the portion transmitted to the direct move terminal 78 from an information centre 71, and the portion transmitted to the move terminal 78 through road-side equipment 74. That is, the communication load about road map information is distributed by the communication load between an information centre 71 and the move terminal 78, and the communication load between road-side equipment 74 and the move terminal 78. In addition, the superposition means in a claim 11 is realized with the information-display means 28.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] as mentioned above -- invention according to claim 1 -- a traffic information offer system -- the difference of traffic informations, such as road map information, -- it constituted so that only information was transmitted to road-side equipment from an information centre, information restoration might be carried out by the road-side equipment side and the local information for every road-side equipment might be transmitted to a mobile side Therefore, road-side equipment can manage a detailed traffic information, without increasing the amount of data transmitted to road-side equipment from an information centre. Consequently, even if the mobile side does not hold the road map database, it is effective in the ability to acquire detailed road map information from a road infrastructure side. Moreover, it is effective in the ability to know the newest road related information. Furthermore, a user has the effect released from the time and effort and the burden of updating and management of a road map database.

[0103] Optimal-path search within a jurisdiction at an information centre was performed for the traffic information offer system, and the individual guide passage way view dealing with the destination was created by the road-side equipment side based on the result, and it constituted from invention according to claim 2 so that road map information, a guide passage way view, and/or road related information might be superimposed according to the demand from a mobile side and a mobile side might be supplied. Therefore, even if the user does not hold the road map database, he is effective in the ability to acquire detailed road map information, and/or the newest road related information and the path guidance information according to the destination from a road infrastructure side. Furthermore, a user has the effect released from the time and effort and the burden of updating and management of a road map database.

[0104] From the information centre, the information on a jurisdiction region was put in block, and multiple address transmission of the traffic information offer system was carried out, and it constituted from invention according to claim 3 so that required information might be started and it might receive by the road-side equipment side. Therefore, if the load of the transmission control to the road-side equipment of an information centre is mitigated and two or more communication media are used in transmission between an information centre and road-side equipment, it is effective in the ability to reduce the amount of transmissions of the information by each communication media by distribution of the amount of transmissions. Furthermore, a user has the effect which can obtain detailed road map information, the path guidance information according to the destination, and the newest road related information from a road infrastructure side even if it does not hold the road map database, and is released from the time and effort and the burden of updating and management of a road map database.

[0105] Since according to invention according to claim 4 it constituted so that road map information was put in block and multiple address transmission of the traffic information offer system was carried out from an information centre, and required road map information might be started and it might receive by the mobile side, when road map information cannot be transmitted with a limit of road-side equipment and the channel capacity between mobile sides, a mobile side is effective in the ability to be able to acquire detailed road map information. Furthermore, a user has the effect which can obtain the newest road related information from a road infrastructure side, and is released from the time and effort and the burden of updating and management of a road map database.

[0106] Since according to invention according to claim 5 it constituted so that a mobile side might set up the classification of required information for a traffic information offer system, information might be required and road-side equipment might offer information according to the demand by the side of a mobile, while a mobile side can receive only required information, it is effective in transmission of unnecessary information not being performed between road-side equipment and a mobile side. Furthermore, a user has the effect which can obtain detailed road map information, the path guidance information according to the destination, and the newest road related information from a road infrastructure side even if it does not hold the road map database, and is released from the time and effort and the burden of updating and management of a road map database.

[0107] Since according to invention according to claim 6 it constituted so that road map information and road related information might be automatically required of a road infrastructure side according to the current position on the road map with which the mobile side holds the traffic information offer system, a user has the effect released from the time and effort of information requirements. Furthermore, a user has the effect which can obtain detailed road map information and the newest road related information from a road infrastructure side even if it does not hold the road map database, and is released from the time and effort and the burden of updating and management of a road map database.

[0108] Since according to invention according to claim 7 the traffic information offer system was constituted so that a mobile side might require road map information and passage related information of a passage infrastructure side automatically according to the updating situation of receipt information, a user has the effect released from the time and effort of information requirements. Furthermore, a user has the effect which can obtain detailed road map information and the newest passage related information from a passage infrastructure side even if it does not hold the road map database, and is released from the time and effort and the burden of updating and management of a road map database.

[0109] Since according to invention according to claim 8 it constituted so that road map information and road related information might be automatically required of a road infrastructure side according to the updating situation of the current position on the road map with which the mobile side holds the traffic information offer system, or receipt information, a user has the effect released from the time and effort of information requirements. Furthermore, a user has the effect which can

obtain detailed road map information and the newest road related information from a road infrastructure side even if it does not hold the road map database, and is released from the time and effort and the burden of updating and management of a road map database.

[0110] and since it constituted so that the information might be used when according to invention according to claim 9 the road map information to which the mobile side already received the traffic information offer system was held by two or more sheets and required road map information was already held, lose unnecessary information requirements -- there is ****** Furthermore, a user has the case where required road map information is not held, and the effect which can acquire detailed road map information from a road infrastructure side even if it does not hold the road map database, and is released from the time and effort and the burden of updating and management of a road map database.

[Translation done.]